

## Major Infrastructure and Environmental Issues Associated with the St. Mary Diversion Facilities

### Lake Sherburne Dam And Reservoir



- Construction on Sherburne Dam began in 1914 and was completed in 1919. A total storage capacity of 68,080 acre-feet is provided in Lake Sherburne.
- Stored water is released to Swiftcurrent Creek during the irrigation season and diverted to the North Fork of the Milk River by the St. Mary Diversion Facilities.
- Current outlet structure is unable to pass low flows during the winter months. As a result, Swiftcurrent Creek dries up and important wintering habitat for the threatened bull trout (*Salvelinus confluentus*) is lost.
- The Blackfeet Tribe and US Bureau of Reclamation have been working to resolve the issue for a number of years.
- Reclamation's appraisal level cost estimate to modify the outlet structure is **\$900,000.**



## Swiftcurrent Creek Bank Stabilization

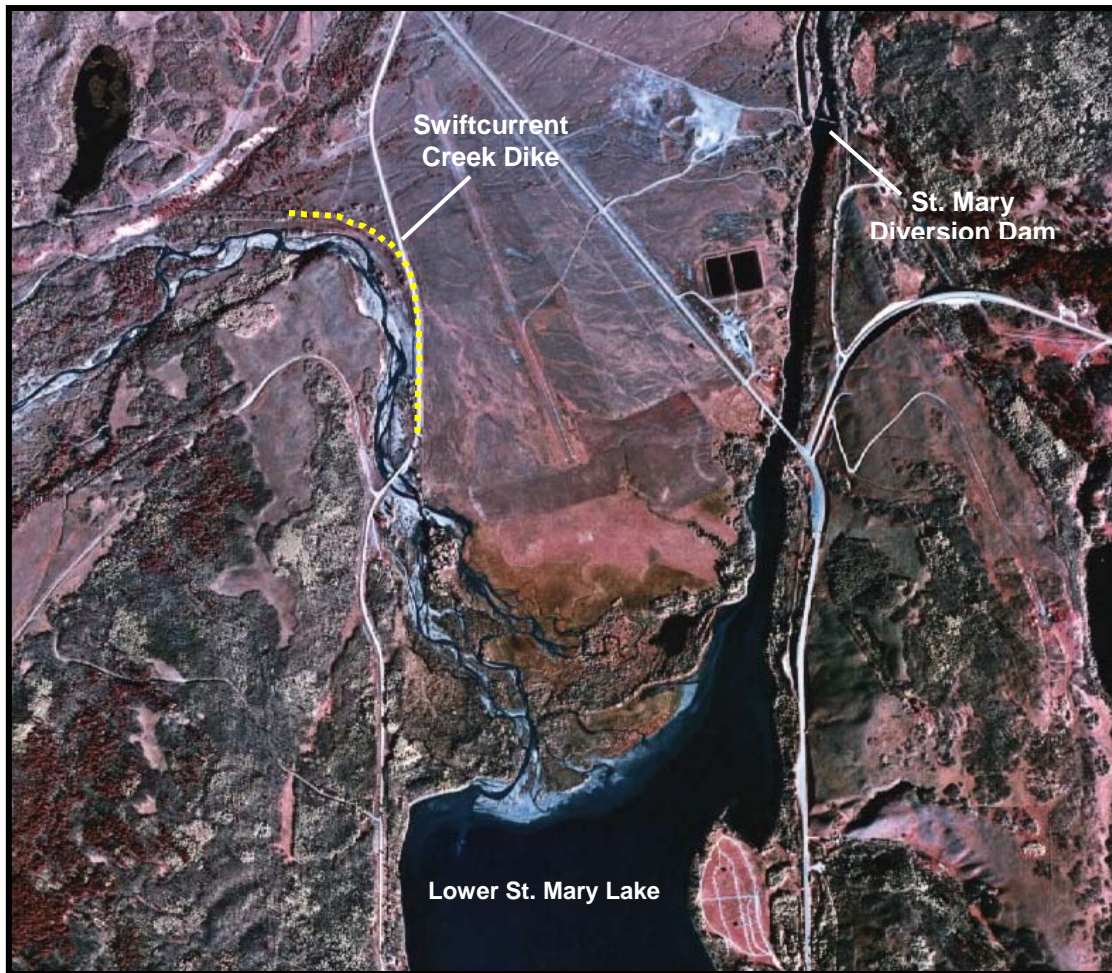


- The banks of Swiftcurrent Creek have been eroding below the confluence of Boulder Creek.
- The channel of Boulder Creek has been unstable since a major flood in 1964.
- Swiftcurrent and Boulder Creeks provide critical habitat for the threatened bull trout.
- The Blackfeet Tribe is concerned with the continued erosion of stream banks and flooding.
- The Bureau of Reclamation's appraisal level cost estimate to stabilize the banks of Swiftcurrent Creek and Boulder Creek is **\$6.6 million**.





## Major Sedimentation in Lower St. Mary Lake



- In 1915 the Bureau of Reclamation completed Swiftcurrent Creek Dike to divert all flows from Swiftcurrent Creek and Boulder Creek into Lower St. Mary Lake.
- Prior to construction of the dike, both streams flowed across the large alluvial fan that is now occupied by the town of Babb, Highway 89, and other development.
- As a result of the dike, the combined sediment load of the two creeks is being deposited into Lower St. Mary Lake. The resulting delta has increased in size by about 16 acres between 1958 and 1990. The Blackfeet Tribe is very concerned with the continued deposition of sediment into the lake.
- The Bureau of Reclamation's appraisal level cost estimate to address this issue is **\$598,000**.

## St. Mary Diversion Dam and Headworks

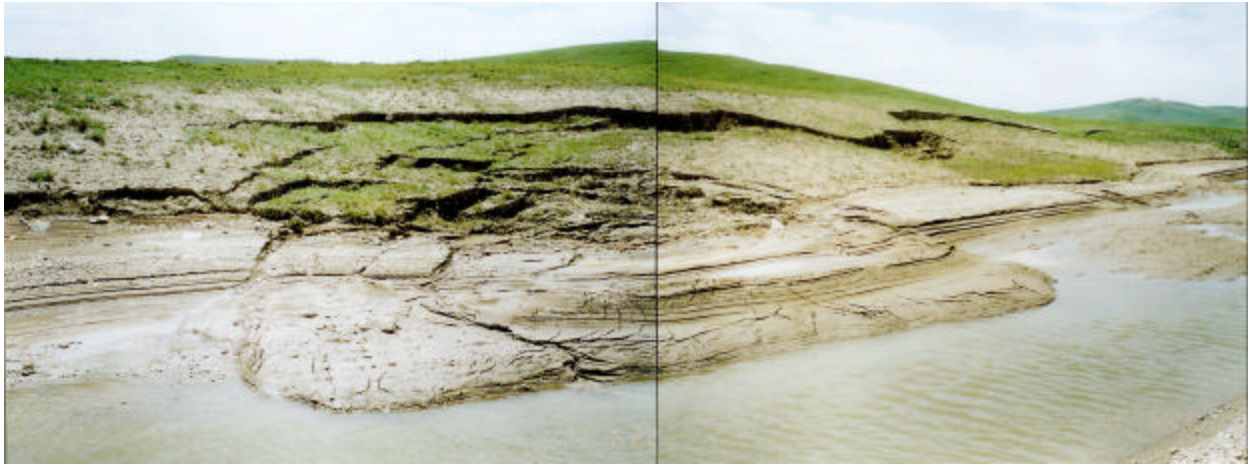


- The St. Mary Diversion Dam and headworks rely on the same basic structures that were constructed around 1910.
- Both structures have large areas of deteriorated and spalling concrete.
- Both structures have a negative impact on fishery resources. The diversion dam acts as a barrier to fish moving upstream and a large number of fish become entrained in the canal through the headgates during the irrigation season.
- The Bureau of Reclamation is currently investigating the extent to which the diversion dam and headgates may be affecting bull trout, which is listed as a threatened species.
- The Bureau of Reclamation's appraisal level cost estimate to build new structures ranges from **\$15.9 million to \$16.7 million** (updated and revised by TD&H, 2005)





## St. Mary Canal



- The St. Mary Canal is an unlined earthen canal approximately 29 miles in length. Construction began in 1907 and completed in 1915.
- Canal capacity has declined from an original design capacity of 850 cfs to a present capacity of approximately 670 cfs.
- Deficiencies along the canal included reduced capacity, slope instabilities, limited freeboard, limited access for maintenance, inoperable check structures and wasteways, and seepage losses
- The Bureau of Reclamation has identified landslides along the canal route as one of their top five concerns.
- The Bureau of Reclamation's appraisal level cost estimate to rehabilitate the canal ranges from **\$80.4 million to \$82.7 million** (updated and revised by TD&H, 2005).



## St. Mary River Siphon



- The St. Mary River Siphon consists of two 90-inch riveted steel barrels that traverse the St. Mary River Valley. Each barrel is approximately 3,200 feet in length. The siphons have a combined discharged capacity of 850 cfs. The left barrel (looking downstream) was constructed from 1912-15, and the right barrel was constructed in 1925-26.
- Due to various soil and weather conditions, the steel barrels and concrete supports have moved considerably since construction, causing buckling of the siphons and compression of the expansion/contraction joints. Leaks in the left barrel resulted in temporary shutdowns of the canal in 2004 and 2005.
- The Bureau of Reclamation has identified the St. Mary River Siphons as one of their top five concerns.
- The Bureau of Reclamation's appraisal level cost estimate to reconstruct the siphons ranges from **\$10 million to \$13.5 million** (updated and revised by TD&H, 2005)





## St. Mary Bridge



- The St. Mary River Bridge was built in 1915 by the Minneapolis Bridge Company. The north side of the bridge carries the twin barrels of the St. Mary Siphon while the south side carries a single lane county road. Overall bridge length is 194 feet.
- Bridge construction consists of a mild steel truss superstructure with a timber decking. Mild steel is not longer desirable in bridge construction due to low tensile and yield strength properties.
- Numerous areas of collision damage are present on the top cords of the steel bracing at both approaches. The timber decking is loose with rot prevalent on the running planks.
- The bridge has been given a National Bridge Inventory Sufficiency Rating of 43 (poor). The mild steel truss cannot support heavy truckloads, the overhead vertical clearance is insufficient, and the concrete abutments are deteriorating.
- Due to its age and deteriorated condition, replacement of the bridge is the number one priority in any rehabilitation effort.
- Great West Engineering estimates the replacement cost at **\$1.86 million**.



## Halls Coulee Siphons



- The Halls Coulee Siphon consists of two-riveted steel pipes, 78 inches in diameter and 1,405 feet in length.
- As with the St. Mary River Siphon, 85 years in the harsh climate has corroded the steel barrels, and weakened the concrete saddle supports.
- The Bureau of Reclamation has identified Hall's Coulee Siphon as one of their top five concerns.
- The Bureau of Reclamation's appraisal level cost estimate to reconstruct the siphons ranges from **\$4.8 million** to **\$4.9 million** (updated and revised by TD&H, 2005).





## Drop Structures



- Water from the St. Mary Canal passes through five reinforced concrete drop structures before reaching the North Fork of the Milk River. Construction of the drop structures began in 1912 and was completed in 1915. The capacity of each structure is 850 cfs.

Drop No.	Length of Drop Structure (ft.)	Vertical Drop (ft.)
1	215	36.5
2	205	29.5
3	139.5	27.8
4	340	67
5	259	57.3

- All five structures suffer from severely deteriorated and spalled concrete. The underlying reinforcing bar is exposed in many places.
- The Bureau of Reclamation has identified replacement of the drop structures as one of their top 5 concerns.
- The Bureau of Reclamation's appraisal level cost estimate to replace all 5 drops ranges from **\$5.2 million** to **\$5.4 million** (updated and revised by TD&H, 2005).

